

SMPS-based DC power supplies are way ahead of thyristors

EM NEWS BUREAU , Tuesday, October 11, 2011, 11:37 Hrs [IST]



— B. Venkataramana, Executive Director, VMC Systems Ltd

Hyderabad-based **VMC Systems** Ltd is India's largest telecom and power-conversion equipment manufacturer. Under an agreement with Australia-based Rectifier Technologies Pacific Pty Ltd, VMC plans to introduce in India high-wattage DC Power Systems built with SMPS technology. **B. Venkataramana** expounds on this technology and explains the significant efficiency of these systems vis-à-vis the conventional thyristor-based technology. Venkataramana is confident that this new breed of smart and scalable DCPS, will find increasing demand from the next-generation requirements of

utilities. An interview by **Venugopal Pillai**.

To begin with, please tell us in simple terms what power conversion (AC to DC and vice versa) means and what role this plays in the supply and consumption of electric power.

All electronics and electrical devices need electricity to function, whether it is to power a simple mobile handset, to a cellular base-station, or even a high data centre. However, for each of these equipments, the operating voltages are different; typically in industrial and commercial applications, you will see operating voltages starting ranging from 24VDC to 220VDC.

However, since the most commonly available power source, is the "socket on the wall 230V AC, to use this power source for industrial and commercial applications, one needs to first "convert" the power from AC to DC, and then "condition" the voltage to the voltage requirement of a particular device [i.e. step down from 220V AC to 24V, 48V, etc, in the DC range]. For areas where there is no availability of AC power [or when AC power temporarily goes down], one needs to provide power-supply from battery. The need for these two applications saw the development of rectifiers and inverters.

A rectifier is a device that converts from AC to DC, and an inverter is one that does the reverse, which means it converts DC power to AC.

Can you illustrate with an example?

From a commercial applications perspective, let us use the example of the power requirements in a cellular base-station. Under normal conditions, the primary power source is AC, and it can come from either the power utility ["socket on the wall" 230V AC, or from an AC generator. But since BTS (base transceiver station) is based on DC power, the AC first needs to be converted to DC; which is done by feeding the AC input into a Rectifier; the output of the rectifier then becomes the primary source of power for all of the equipment within the BTS cellular station. A secondary output from the rectifier charges a bank of batteries that kick-in, when there is a power failure.

In some cases there may be legacy systems [which require 230VAC only], but if there is no 220VAC available except for a bank of batteries, then one would need an Inverter, which takes the DC power coming from this battery bank as input, and converts into 230VAC on the output side, and

feeds that legacy system.

What is the size of the Indian power conversion market and what is likely to be the growth rate in the medium term? What will be the major business drivers?

Our conservative estimates for the industrial/commercial segments work out to be in excess of Rs.1,000 crore per year at a CAGR of at least 20 per cent. Primary growth drivers would be telecommunications (both the 3G roll-out as well as broadband expansions), as well as the focus from government from an infrastructure development perspective in the upcoming XII Plan period.



Please tell us about the SMPS-based high-wattage DC Power Systems that VMC plans to manufacture in India in collaboration with Australia-based Rectifier Technologies Pacific.

These DCPS are based on SMPS technology, which are lighter, smaller, and modular in nature compared to traditional DC Power Systems [which are thyristor-based]. In addition to the small foot print and ease of install; other key USPs includes features such as remote management and programmability of these systems without the need to add additional components into the systems. These features bring in aspects of intelligence, "smartness", and future-proofing into such systems - allowing us to bring India's power management capabilities in a variety of applications like power distribution utilities [SCADA] and telecommunications power manageability, on par with rest of the world.

What was the rationale behind selecting RTP as your technology partner?

RTP is a very focused company that specializes in the design of DC power systems for a variety of commercial and industrial applications. They have built a reputation over the years in this industry for innovation and reliability of their SMPS based technology, and has a large installed base worldwide. It was these factors that made them a natural choice for us for this collaboration.

How does the SMPS-based technology for DC power systems differ from the extant thyristor-based technology?

In addition to the technical advantages that I spoke of earlier, SMPS-based DC power systems are much higher-efficiency systems than traditional thyristor-based systems with much almost unity power factor. From a commercial perspective also, SMPSbased DCPS are much more friendly CapEx perspective, being economical over the latter by 20-40 per cent. Further, because of their modularity, they can be quickly replaced through a simple plugin thereby reducing downtime, from around 8 hours to less than 10 minutes! Bottom-line, either from an ROI or a TCO perspective, SMPS-based DCPS are way ahead of their Thyristor counterparts.

Given that this technology is unprecedented, what challenges do you foresee in its acceptance in India?

Thyristor-based systems were introduced in the early 1970s, and their advent in India was in the mid-1980s. As is the case with any legacy system, inertia and hesitancy to move from the "tried and tested" will be the primary challenge. However, with rapid growth in infrastructure and pressures from both cost as well as features standpoint, we believe the case is clear for such next generation technology.



Tell us about the principal demand drivers of DC power systems?

There are a variety of applications such as SCADA (Supervisory Control and Data Acquisition) for utilities [including power, oil & gas, etc]; telecommunication and data centres; railways; metro rail applications, etc.

Given that various state governments are implementing ITbased initiatives under RAPDRP-Part A, tell us in particular about the demand from electricity distribution utilities.

Part-A is limited to data-centres. It is in Part-B where there is requirement for DCPS type of systems. The role for DCPS in RAPDRP would be to power RTUs, and help in the connectivity and remote manageability of these various substation systems with a central monitoring system in the state headquartered control room.

Do DC power systems have a role to play in HVDC power transmission infrastructure?

Absolutely!

Tell us about the new manufacturing facility in terms of location, investment, current status and expected commissioning date.

VMC has a state-of-the-art facility in Hyderabad which has around 75,000 sqft manufacturing floor space. It is currently operational, with world-class manufacturing equipment. It is located in Hyderabad, Andhra Pradesh, only 10 minutes from the international airport.